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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/008,713	12/07/2001	Ryoichi Mukai	0671.66045	5134

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EXAMINER

RICKMAN, HOLLY C

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 02/13/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/008,713

Applicant(s)

ROACH, JOHN F.

Examiner

Holly Rickman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 7-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 7-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The objection to the drawings is withdrawn in view of Applicant's amendment to the specification.

Specification

2. The objection to the disclosure is withdrawn in view of Applicant's amendments.

Claim Objections

3. The objection to claim 4 is withdrawn in view of Applicant's amendments.

Claim Rejections - 35 USC § 112

4. The rejection of claims 1-7 under 35 U.S.C. 112, second paragraph, is withdrawn in view of Applicant's amendments to the claims.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. Claims ~~1~~, ~~3~~, and ~~8-9~~ are rejected under 35 U.S.C. 102(b) as being anticipated by Mukai (US 5759617).

Mukai discloses a magnetic recording medium formed by sputtering a non-magnetic underlayer on a substrate, sputtering a magnetic layer on the underlayer and then annealing to diffuse components of the underlayer into the crystal boundaries of the magnetic layer. The reference teaches that the underlayer is formed from a material such as Cr and the magnetic layer is formed from a Co based material such as Co (col. 2, lines 17-31 and 38-43; col. 2, line 66 to col. 3, line 13). The reference also teaches that the underlayer is generally between 20 and 50 nm thick (col. 3, lines 7-8).

7. The rejection of claims 4-5 under 35 U.S.C. 102(b) as being anticipated by Mukai (US 5759617) is rendered moot by the cancellation of these claims.

8. The rejection of claims 4-5 under 35 U.S.C. 102(b) as being anticipated by Kobayashi (JP 8-329464) is rendered moot by the cancellation of these claims.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mukai (US 5759617).

Mukai discloses a magnetic recording medium formed by sputtering a non-magnetic underlayer on a substrate, sputtering a magnetic layer on the underlayer and then annealing to diffuse components of the underlayer into the crystal boundaries of the magnetic layer. The reference teaches that the underlayer is formed from a material such as Cr and the magnetic layer is formed from an alloy such as CoCr, CoCrPt (col. 2, lines 17-31 and 38-43; col. 2, line 66 to col. 3, line 13). Mukai is silent with respect to the amount of Cr that is diffused into the magnetic layer.

Mukai teaches that the presence of Cr or other non-magnetic material at the crystal boundaries of the magnetic layer helps improve coercivity and reduce noise levels. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to optimize the amount of Cr diffused into the magnetic layer in order to achieve optimal coercivity and reduced noise. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

11. The rejection of claim 2 under 35 U.S.C. 103(a) as being unpatentable over Kobayashi (JP 8-329464) is withdrawn in view of Applicant's amendments.

12. The rejection of claim 6 under 35 U.S.C. 103(a) as being unpatentable over Mukai (US 5759617) in view of Marinero et al. (US 6268036) is rendered moot by the cancellation of the claim.

13. The rejection of claim 6 under 35 U.S.C. 103(a) as being unpatentable over Kobayashi (JP 8-329464) in view of Marinero et al. (US 6268036) is rendered moot by the cancellation of the claim.

14. Claims ~~7~~ and ~~11~~ are rejected under 35 U.S.C. 103(a) as being unpatentable over Mukai (US 5759617) in view of Gui et al. (US 6153284).

Mukai discloses a magnetic recording medium formed by sputtering a non-magnetic underlayer on a substrate, sputtering a magnetic layer on the underlayer and then annealing to diffuse components of the underlayer into the crystal boundaries of the magnetic layer. The reference teaches that the underlayer is formed from a material such as Cr and the magnetic layer is formed from a Co based material such as Co (col. 2, lines 17-31 and 38-43; col. 2, line 66 to col. 3, line 13).

Mukai is silent with respect to the use of a spindle motor, a magnetic head, and an actuator.

Gui et al. teach that a conventional magnetic disk drive includes a magnetic recording medium, a disk drive motor with an associated spindle, a magnetic head, and a head actuator (col. 2, lines 30-41).

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the magnetic recording disk taught by Mukai with a spindle motor, magnetic head, and actuator as taught by Gui et al. in order to produce a functional disk drive.

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15. The rejection of claim 7 under 35 U.S.C. 103(a) as being unpatentable over Kobayashi (JP 8-329464) in view of Gui et al. (US 6153284) is withdrawn in view of Applicant's arguments.

Claim Rejections - 35 USC § 102/103

16. The rejection of claims 1 and 3 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kobayashi (JP 8-329464) is withdrawn in view of Applicant's arguments.

Response to Arguments

17. Applicant's arguments filed 11/29/02 have been fully considered but they are not persuasive.

Applicant argues that Mukai fails to anticipate or render obvious the present claims because the reference fails to teach a Co magnetic layer having Cr **only** at the grain boundaries. Applicant argues that Mukai form the magnetic layer by a different method; a method that does not involve the diffusion of Cr from an underlayer into the grain boundaries of an overlying Co based layer via a post-annealing process.

The Examiner respectfully disagrees and maintains the position that Mukai does teach the limitation directed to Cr located only at the Co/Co alloy grain boundaries. The reference teaches that a purely Co magnetic layer can be used with a Cr underlayer beneath. The reference states that:

“grain boundary interaction between magnetic metal crystal grains is inhibited by dispersing and segregating the components of [the] base layer

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along the [grain] boundary of the magnetic metal polycrystalline layer by post-annealing.” See col. 3, lines 9-13.

Thus, one can only conclude that diffusion of Cr into the magnetic layer is limited to the grain boundary regions.

With regard to the amount of Cr diffused into the Co layer, the Examiner maintains that Mukai teaches that this amount is a result effective variable that would have been obvious to optimize.

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Rickman whose telephone number is (703) 305-2642. The examiner can normally be reached on Monday-Friday 9:30-6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (703) 308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

A handwritten signature in cursive script, appearing to read "Holly Rickman".

Holly Rickman
Primary Examiner
Art Unit 1773

hcr
February 11, 2003